

## 8-4: Geometric Series

**Warm-up:** 1. Find a formula for the sum  $S_n$  of the first  $n$  terms of the geometric series  $1+3+9+\dots$

2. Use this formula to determine the sum of the first 10 terms of the series.

*Geometric Series:*

*$n^{\text{th}}$  Partial Sum:*

*Theorem:*

*Example 1:* Evaluate  $\sum_{n=1}^6 10(.75)^{i-1}$ .

*Example 2:* In a set of 10 Russian nesting dolls, each doll is  $\frac{5}{6}$  the height of the next taller one. If the height of the first doll is 15 cm, what is the total height of the dolls?

*Example 3:* Suppose you have two children who marry and each of them has two children. Each of these offspring has two children, and so on. If all of these progeny marry but none marry each other (that would be gross!), and all have two children, in how many generations will you have a thousand descendants? Count your children as generation 1.

Homework:

*“Parents can only give good advice or put them [children] on the right paths, but the final forming of a person's character lies in their own hands.” - Anne Frank*